

SEQUENCE LISTING

<110> PRO-VIRUS, INC.

<120> ONCOLYTIC VIRUS

<130> 2370-62

<140> PCT/US00/25510

<141> 2000-09-18

<150> 09/397,873

<151> 1999-09-17

<160> 52

<170> PatentIn Ver. 2.1

<210> 1

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 1

Cys	Thr	Thr	His	Arg	His	His	Thr	Ser	Asn	Cys
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<210> 2

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 2

Cys	Leu	Asn	Ala	His	Arg	Thr	Thr	His	His	His	Cys
1				5					10		

<210> 3

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 3

Cys	His	Gly	Leu	His	Ser	Asn	Met	Arg	His	Cys
1				5					10	

<210> 4
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 4
Cys His His His His Arg Leu Asn Cys
1 5

<210> 5
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 5
Cys His Ser His His His Arg Gly Cys
1 5

<210> 6
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6
Cys Trp Asp His His Asn His His Cys
1 5

<210> 7
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7
Cys Asp Asn Asn His His His His Cys
1 5

<210> 8
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8
Cys His His His Arg Ile Ser Ser His Cys
1 5 10

<210> 9
<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

<400> 9
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aatgaggatc cagtggaata cccggcagat tacttcagaa aatcaaagga gattcctctt 120
tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt aaaggacatc 240
cggggtaagt tggataaaga ttgggtcaagt ttcggaataa acatcgggaa agcaggggat 300
acaatcggaa tatttgacct tgtatccttg aaagccctgg acggcggtact tccagatgga 360
gtatcggatg cttccagaac cagcgcagat gacaaatggg tgcctttgta tctacttggc 420
ttatacagag tgggcagaac acaaatgcct gaatacagaa aaaagctcat ggatgggctg 480
acaaatcaat gcaaaatgat caatgaacag tttgaacctc ttgtgccaga aggtcgtgac 540
atTTTTgatg tgtggggaaa tgacagtaat tacacaaaaa ttgtcgtgc agtggacatg 600
ttcttcaca tgttcaaaaa acatgaatgt gcctcgttca gatacggaa tattgtttcc 660
agattcaaa attgtgctgc attggcaaca ttggacacc tctgcaaaat aaccggaatg 720
tctacagaag atgtaacgac ctggatcttg aaccgagaag ttgcagatga aatggtccaa 780
atgatgcttc caggccaaga aattgacaag gccgattcat acatgcctta tttgatcgac 840
tttgattgtt cttctaagtc tccatattct tccgtcaaaa accctgcctt ccacttctgg 900
gggcaattga cagctcttct gctcagatcc accagagcaa ggaatgcccg acagcctgat 960
gacattgagt atacatctct tactacagca ggtttgttgt acgcttatgc agtaggatcc 1020
tctgccgact tggcacaaca gttttgtgtt ggagataaca aatacactcc agatgatagt 1080
accggaggat tgacgactaa tgcaccgcca caaggcagag atgtggtcga atggctcgga 1140
tggtttgaag atcaaaacag aaaaccgact cctgatatga tgcagtatgc gaaaagagca 1200
gtcatgtcac tgcaaggcct aagagagaag acaattggca agtatgctaa gtcagaattt 1260
gacaaatga 1269

<210> 10
<211> 1269
<212> DNA
<213> Vesicular stomatitis virus

<400> 10
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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240
cggggtaagt tggataaaga ttgggtcaagt ttcggaataa acatcgggaa ggcaggggat 300
acaatcggaa tatttgacct tgtatccttg aaagccctgg acgggtgtact tccagatgga 360

gtatcggatg	cttccagaac	cagcgcagat	gacaaatggg	tgcctttgta	tctacttggc	420
ttatacagag	tgggcagaac	acaaatgcct	gaatacagaa	aaaggctcat	ggatgggctg	480
acaaatcaat	gcaaaatgat	caatgaacag	tttgaacctc	ttgtgccaga	aggctcgtgac	540
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ttcttccaca	tgttcaaaaa	acatgaatgt	gcctcgttca	gatacggaac	tattgtttcc	660
agattcaaag	attgtgctgc	attggcaaca	tttggacacc	tctgcaaaat	aaccggaatg	720
tctacagaag	atgtaacgac	ctggatcttg	aaccgagaag	ttgcagatga	gatgggtccaa	780
atgatgcttc	caggccaaga	aattgacaag	gccgattcat	acatgcctta	tttgatcgac	840
tttggattgt	cttctaagtc	tccatattct	tccgtcaaaa	accctgcctt	ccacttctgg	900
gggcaattga	cagctcttct	gctcagatcc	accagagcaa	ggaatgcccg	acagcctgat	960
gacattgagt	atacatctct	tactacagca	ggtttgttgt	acgcttatgc	agtaggatcc	1020
tctgctgact	tggcacaaca	gttttgtgtt	ggagatagca	aatacactcc	agatgatagt	1080
accggaggat	tgacgactaa	tgaccgcga	caaggcagag	atgtggtcga	atggctcgga	1140
tggtttgaag	atcaaaacag	aaaaccgact	cctgatatga	tgagtatgc	gaaacgagca	1200
gtcatgtcac	tgcaaggcct	aagagagaag	acaattggca	agtatgctaa	gtcagaattt	1260
gacaaatga						1269

<210> 11

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 11

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tacatcaata	ctacaaaaag	tttgtcagat	ctaagaggat	atgtctacca	aggcctcaaa	180
tccggaaatg	tatcaatcat	acatgtcaac	agctacttgt	atggagcatt	gaaggacatc	240
cggggtaagt	tggataaaga	ttgggtcaagt	ttcgggaataa	acatcgggaa	ggcaggggat	300
acaatcggaa	tatttgacct	tgtatccttg	aaagccctgg	acggtgtact	tccagatgga	360
gtatcggatg	cttccagaac	cagcgcagat	gacaaatggg	tgcctttgta	tctacttggc	420
ttatacagag	tgggcagaac	acaaatgcct	gaatacagaa	aaaggctcat	ggatgggctg	480
acaaatcaat	gcaaaatgat	caatgaacag	tttgaacctc	ttgtgccaga	aggctcgtgac	540
atTTTTgatg	tgtggggaaa	tgacagtaat	tacacaaaaa	ttgtcgctgc	agtggacatg	600
ttcttccaca	tgttcaaaaa	acatgaatgt	gcctcgttca	gatacggaac	tattgtttcc	660
agattcaaag	attgtgctgc	attggcaaca	tttggacacc	tctgcaaaat	aaccggaatg	720
tctacagaag	atgtaacgac	ctggatcttg	aaccgagaag	ttgcagatga	gatgggtccaa	780
atgatgcttc	caggccaaga	aattgacaag	gccgattcat	acatgcctta	tttgatcgac	840
tttggattgt	cttctaagtc	tccatattct	tccgtcaaaa	accctgcctt	ccacttctgg	900
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gacattgagt	atacatctct	tactacagca	ggtttgttgt	acgcttatgc	agtaggatcc	1020
tctgctgact	tggcacaaca	gttttgtgtt	ggagatagca	aatacactcc	agatgatagt	1080
accggaggat	tgacgactaa	tgaccgcga	caaggcagag	atgtggtcga	atggctcgga	1140
tggtttgaag	atcaaaacag	aaaaccgact	cctgatatga	tgagtatgc	gaaacgagca	1200
gtcatgtcac	tgcaaggcct	aagagagaag	acaattggca	agtatgctaa	gtcagaattt	1260
gacaaatga						1269

<210> 12

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 12

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tacatcaata	ctacaaaaag	tttgtcagat	ctaagaggat	atgtctacca	aggcctcaaa	180

tccggaaatg	tatcaatcat	acatgtcaac	agctacttgt	atggagcatt	gaaggacatc	240
cggggtaagt	tggataaaga	ttgggtcaagt	tccggaataa	acatcgggaa	ggcaggggat	300
acaatcggaa	tatttgacct	tgtatccttg	aaagccctgg	acggtgtact	tccagatgga	360
gtatcggatg	cttccagaac	cagcgcagat	gacaaatggg	tgcctttgta	tctacttggc	420
ttatacagag	tgggcagaac	acaaatgcct	gaatacagaa	aaaggctcat	ggatgggctg	480
acaaatcaat	gcaaaatgat	caatgaacag	tttgaacctc	ttgtgccaga	aggtcgtgac	540
atttttgatg	tgtggggaaa	tgacagtaat	tacacaaaaa	ttgtcgtgc	agtggacatg	600
ttcttccaca	tgttcaaaaa	acatgaatgt	gcctcgttca	gatacggaac	tattgtttcc	660
agattcaaag	atttgtgctgc	attggcaaca	tttggacacc	tctgcaaaat	aaccggaatg	720
tctacagaag	atgtaacgac	ctggatcttg	aaccgagaag	ttgcagatga	gatgggtccaa	780
atgatgcttc	caggccaaga	aattgacaag	gccgattcat	acatgcctta	tttgatcgac	840
tttggattgt	cttctaagtc	tccatattct	tccgtcaaaa	accctgcctt	ccacttcttg	900
gggcaattga	cagctcttct	gctcagatcc	accagagcaa	ggaatgcccg	acagcctgat	960
gacattgagt	atacatctct	tactacagca	gggttgttgt	acgcttatgc	agtaggatcc	1020
tctgctgact	tggcacaaca	gttttgttgt	ggagatagca	aatacactcc	agatgatagt	1080
accggaggat	tgacgactaa	tgcaccgcca	caaggcagag	atgtgggtcga	atgggtcggga	1140
tggtttgaag	atcaaaacag	aaaaccgact	cctgatatga	tgcagtatgc	gaaacgagca	1200
gtcatgtcac	tgcaaggcct	aagagagaag	acaattggca	agtatgctaa	gtcagaattt	1260
gacaaatga						1269

<210> 13
 <211> 1029
 <212> DNA
 <213> Vesicular stomatitis virus

<220>
 <221> modified_base
 <222> (1)..(1029)
 <223> "n" represents a, t, c, g, other or unknown

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tttgaccttg	tatccttgaa	agccctggac	ggtgtacttc	cagatggagt	atcggatgct	180
tccagaacca	gcgcagatga	caaatgggtg	cctttgtatc	tacttggctt	atacagagtg	240
ggcagaacac	aatgcctga	atacagaaaa	aggctcatgg	atgggctgac	aaatcaatgc	300
aaaatgatca	atgaacagtt	tgaacctctt	gtgccagaag	gtcgtgacat	ttttgatgtg	360
tggggaaatg	acagtaatta	cacaaaaatt	gtcgtgtcag	tggacatggt	cttccacatg	420
ttcaaaaaac	atgaatgtgc	ctcgttcaga	tacggaaacta	ttgtttccag	attcaaagat	480
tgtgctgcat	tggcaacatt	tggacacctc	tgcaaaaataa	ccggaatgtc	tacagaagat	540
gtaacgacct	ggatcttgaa	ccgagaagtt	gcagatgaga	tgggtccaaat	gatgcttcca	600
ggccaagaaa	ttgacaaggc	cgattcatat	atgccttatt	tgatcgactt	tggattgtct	660
tctaagtctc	catattcttc	cgtcaaaaaac	cctgccttcc	acttctgggg	gcaattgact	720
gacattgagt	atacatctcn	tactacagca	ggtttgttgt	acgcttatgc	agtaggatcc	780
tctgctgact	tggcacanca	gttttgttgt	ggagatagca	aatacactcc	agatgatagt	840
accggaggat	tgacgactaa	tgcaccgcca	caaggcagag	atgtgggtcga	atgggtcggga	900
tggtttgaag	atcaaaacag	aaaaccgact	cctgatatga	tgcagtatgc	gaaacgagca	960
gtcatgtcac	tgcaaggcct	aagagagaag	acaattggca	agtatgctaa	gtcagaattt	1020
gacaaatga						1029

<210> 14
 <211> 422
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 14

Met	Ser	Val	Thr	Val	Lys	Arg	Ile	Ile	Asp	Asn	Thr	Val	Ile	Val	Pro	
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Lys	Leu	Pro	Ala	Asn	Glu	Asp	Pro	Val	Glu	Tyr	Pro	Ala	Asp	Tyr	Phe	
			20					25					30			
Arg	Lys	Ser	Lys	Glu	Ile	Pro	Leu	Tyr	Ile	Asn	Thr	Thr	Lys	Ser	Leu	
		35					40					45				
Ser	Asp	Leu	Arg	Gly	Tyr	Val	Tyr	Gln	Gly	Leu	Lys	Ser	Gly	Asn	Val	
	50					55					60					
Ser	Ile	Ile	His	Val	Asn	Ser	Tyr	Leu	Tyr	Gly	Ala	Leu	Lys	Asp	Ile	
65					70					75					80	
Arg	Gly	Lys	Leu	Asp	Lys	Asp	Trp	Ser	Ser	Phe	Gly	Ile	Asn	Ile	Gly	
				85					90					95		
Lys	Ala	Gly	Asp	Thr	Ile	Gly	Ile	Phe	Asp	Leu	Val	Ser	Leu	Lys	Ala	
			100					105					110			
Leu	Asp	Gly	Val	Leu	Pro	Asp	Gly	Val	Ser	Asp	Ala	Ser	Arg	Thr	Ser	
	115						120					125				
Ala	Asp	Asp	Lys	Trp	Leu	Pro	Leu	Tyr	Leu	Leu	Gly	Leu	Tyr	Arg	Val	
	130					135					140					
Gly	Arg	Thr	Gln	Met	Pro	Glu	Tyr	Arg	Lys	Lys	Leu	Met	Asp	Gly	Leu	
145					150					155					160	
Thr	Asn	Gln	Cys	Lys	Met	Ile	Asn	Glu	Gln	Phe	Glu	Pro	Leu	Val	Pro	
			165						170					175		
Glu	Gly	Arg	Asp	Ile	Phe	Asp	Val	Trp	Gly	Asn	Asp	Ser	Asn	Tyr	Thr	
		180						185					190			
Lys	Ile	Val	Ala	Ala	Val	Asp	Met	Phe	Phe	His	Met	Phe	Lys	Lys	His	
	195						200					205				
Glu	Cys	Ala	Ser	Phe	Arg	Tyr	Gly	Thr	Ile	Val	Ser	Arg	Phe	Lys	Asp	
	210					215					220					
Cys	Ala	Ala	Leu	Ala	Thr	Phe	Gly	His	Leu	Cys	Lys	Ile	Thr	Gly	Met	
225					230					235					240	
Ser	Thr	Glu	Asp	Val	Thr	Thr	Trp	Ile	Leu	Asn	Arg	Glu	Val	Ala	Asp	
			245						250					255		
Glu	Met	Val	Gln	Met	Met	Leu	Pro	Gly	Gln	Glu	Ile	Asp	Lys	Ala	Asp	
		260						265					270			
Ser	Tyr	Met	Pro	Tyr	Leu	Ile	Asp	Phe	Gly	Leu	Ser	Ser	Lys	Ser	Pro	
	275						280					285				
Tyr	Ser	Ser	Val	Lys	Asn	Pro	Ala	Phe	His	Phe	Trp	Gly	Gln	Leu	Thr	
	290				295						300					

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp
 305 310 315 320
 Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
 325 330 335
 Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp
 340 345 350
 Asn Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
 355 360 365
 Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
 370 375 380
 Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
 385 390 395 400
 Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
 405 410 415
 Lys Ser Glu Phe Asp Lys
 420

<210> 15
 <211> 422
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 15
 Met Ser Val Thr Val Lys Arg Ile Ile Ala Asn Thr Val Ile Val Pro
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 Lys Leu Pro Ala Asn Glu Asp Pro Val Glu Tyr Pro Ala Asp Tyr Phe
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 Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu
 35 40 45
 Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
 50 55 60
 Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
 65 70 75 80
 Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
 85 90 95
 Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
 100 105 110
 Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
 115 120 125

[illegible]

<210> 16
 <211> 422
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 16

Met	Ser	Val	Thr	Val	Lys	Arg	Ile	Ile	Asp	Asn	Thr	Val	Ile	Val	Pro
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			20					25					30		
Arg	Lys	Ser	Lys	Glu	Ile	Pro	Leu	Tyr	Ile	Asn	Thr	Thr	Lys	Ser	Leu
		35					40					45			
Ser	Asp	Leu	Arg	Gly	Tyr	Val	Tyr	Gln	Gly	Leu	Lys	Ser	Gly	Asn	Val
	50					55					60				
Ser	Ile	Ile	His	Val	Asn	Ser	Tyr	Leu	Tyr	Gly	Ala	Leu	Lys	Asp	Ile
65					70					75					80
Arg	Gly	Lys	Leu	Asp	Lys	Asp	Trp	Ser	Ser	Phe	Gly	Ile	Asn	Ile	Gly
				85					90					95	
Lys	Ala	Gly	Asp	Thr	Ile	Gly	Ile	Phe	Asp	Leu	Val	Ser	Leu	Lys	Ala
			100					105					110		
Leu	Asp	Gly	Val	Leu	Pro	Asp	Gly	Val	Ser	Asp	Ala	Ser	Arg	Thr	Ser
	115						120					125			
Ala	Asp	Asp	Lys	Trp	Leu	Pro	Leu	Tyr	Leu	Leu	Gly	Leu	Tyr	Arg	Val
	130					135					140				
Gly	Arg	Thr	Gln	Met	Pro	Glu	Tyr	Arg	Lys	Arg	Leu	Met	Asp	Gly	Leu
145				150						155					160
Thr	Asn	Gln	Cys	Lys	Met	Ile	Asn	Glu	Gln	Phe	Glu	Pro	Leu	Val	Pro
				165					170					175	
Glu	Gly	Arg	Asp	Ile	Phe	Asp	Val	Trp	Gly	Asn	Asp	Ser	Asn	Tyr	Thr
			180					185					190		
Lys	Ile	Val	Ala	Ala	Val	Asp	Met	Phe	Phe	His	Met	Phe	Lys	Lys	His
		195					200					205			
Glu	Cys	Ala	Ser	Phe	Arg	Tyr	Gly	Thr	Ile	Val	Ser	Arg	Phe	Lys	Asp
	210					215					220				
Cys	Ala	Ala	Leu	Ala	Thr	Phe	Gly	His	Leu	Cys	Lys	Ile	Thr	Gly	Met
225					230					235					240
Ser	Thr	Glu	Asp	Val	Thr	Thr	Trp	Ile	Leu	Asn	Arg	Glu	Val	Ala	Asp
				245					250					255	
Glu	Met	Val	Gln	Met	Met	Leu	Pro	Gly	Gln	Glu	Ile	Asp	Lys	Ala	Asp
			260					265					270		

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
 275 280 285
 Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
 290 295 300
 Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp
 305 310 315 320
 Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
 325 330 335
 Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp
 340 345 350
 Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
 355 360 365
 Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
 370 375 380
 Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
 385 390 395 400
 Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
 405 410 415
 Lys Ser Glu Phe Asp Lys
 420

<210> 17
 <211> 342
 <212> PRT
 <213> Vesicular stomatitis virus

<220>
 <221> MOD_RES
 <222> (1)..(342)
 <223> "Xaa" represents any, other or unknown amino acid

<400> 17
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 Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
 20 25 30
 Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
 35 40 45
 Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
 50 55 60
 Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
 65 70 75 80

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu
 85 90 95
 Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
 100 105 110
 Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
 115 120 125
 Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
 130 135 140
 Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp
 145 150 155 160
 Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met
 165 170 175
 Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp
 180 185 190
 Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp
 195 200 205
 Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
 210 215 220
 Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
 225 230 235 240
 Asp Ile Glu Tyr Thr Ser Xaa Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
 245 250 255
 Ala Val Gly Ser Ser Ala Asp Leu Ala Xaa Gln Phe Cys Val Gly Asp
 260 265 270
 Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
 275 280 285
 Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
 290 295 300
 Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
 305 310 315 320
 Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
 325 330 335
 Lys Ser Glu Phe Asp Lys
 340

<210> 18
<211> 798
<212> DNA
<213> Vesicular stomatitis virus

<400> 18
atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct ggatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggatg gagtggaaga gcatactaat cctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaagggt tgtatgcaca ggatccagaa 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcaga tgaggaagtg 300
gatgttgtat ttacttcgga ctggaaacca cctgagcttg aatctgacga gcatggaaaag 360
accttacggt tgacatcgcc agagggttta agtgagagc agaaatccca gtggctttcg 420
acgattaaag cagtcgtgca aagtgccaaa tactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat tatgaaggag cgccagataa ctccggatgt atataagggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagcag tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagag ttcatctctg tcggaggtga cggacgaatg 720
tctcataaag aggccatcct gctcggcctg agatacaaaa agttgtacaa tcaggcgaga 780
gtcaaattatt ctctgtag 798

<210> 19
<211> 798
<212> DNA
<213> Vesicular stomatitis virus

<400> 19
atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtggaaga gcatactagg cctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccgga 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360
accttacggt tgacattgcc agagggttta agtgagagc agaaatccca gtggcttttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataagggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcatctctg tcggaggtaa cggacgaatg 720
tctcataaag aggccatcct gctcggctctg aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaattatt ctctgtag 798

<210> 20
<211> 570
<212> DNA
<213> Vesicular stomatitis virus

<400> 20
atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtggaaga gcatactagg cctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccgga 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360
accttacggt tgacattgcc agagggttta agtgagagc agaaatccca gtggcttttg 420

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acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa                                     570

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<210> 21
<211> 798
<212> DNA
<213> Vesicular stomatitis virus

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<400> 21
atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccgga 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
accttacggt tgacattgcc agagggttta agtggagagc agaaatccca gtggcctttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa tcggaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720
tctcataaag aggccatcct gtcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag                                     798

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<210> 22
<211> 798
<212> DNA
<213> Vesicular stomatitis virus

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```

<400> 22
atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccgga 240
gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
accttacggt tgacattgcc agagggttta agtggagagc agaaatccca gtggcctttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720
tctcataaag aggccatcct gtcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag                                     798

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<210> 23
 <211> 265
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 23

Met	Asp	Asn	Leu	Thr	Lys	Val	Arg	Glu	Tyr	Leu	Lys	Ser	Tyr	Ser	Arg
1				5					10					15	
Leu	Asp	Gln	Ala	Val	Gly	Glu	Ile	Asp	Glu	Ile	Glu	Ala	Gln	Arg	Ala
		20						25					30		
Glu	Lys	Ser	Asn	Tyr	Glu	Leu	Phe	Gln	Glu	Asp	Gly	Val	Glu	Glu	His
		35					40					45			
Thr	Lys	Pro	Ser	Tyr	Phe	Gln	Ala	Ala	Asp	Asp	Ser	Asp	Thr	Glu	Ser
	50					55					60				
Glu	Pro	Glu	Ile	Glu	Asp	Asn	Gln	Gly	Leu	Tyr	Ala	Gln	Asp	Pro	Glu
65					70					75					80
Ala	Glu	Gln	Val	Glu	Gly	Phe	Ile	Gln	Gly	Pro	Leu	Asp	Asp	Tyr	Ala
				85					90					95	
Asp	Glu	Glu	Val	Asp	Val	Val	Phe	Thr	Ser	Asp	Trp	Lys	Pro	Pro	Glu
			100					105					110		
Leu	Glu	Ser	Asp	Glu	His	Gly	Lys	Thr	Leu	Arg	Leu	Thr	Ser	Pro	Glu
		115					120					125			
Gly	Leu	Ser	Gly	Glu	Gln	Lys	Ser	Gln	Trp	Leu	Ser	Thr	Ile	Lys	Ala
130						135					140				
Val	Val	Gln	Ser	Ala	Lys	Tyr	Trp	Asn	Leu	Ala	Glu	Cys	Thr	Phe	Glu
145					150					155					160
Ala	Ser	Gly	Glu	Gly	Val	Ile	Met	Lys	Glu	Arg	Gln	Ile	Thr	Pro	Asp
				165					170					175	
Val	Tyr	Lys	Val	Thr	Pro	Val	Met	Asn	Thr	His	Pro	Ser	Gln	Ser	Glu
			180					185					190		
Ala	Val	Ser	Asp	Val	Trp	Ser	Leu	Ser	Lys	Thr	Ser	Met	Thr	Phe	Gln
		195					200					205			
Pro	Lys	Lys	Ala	Ser	Leu	Gln	Pro	Leu	Thr	Ile	Ser	Leu	Asp	Glu	Leu
	210					215					220				
Phe	Ser	Ser	Arg	Gly	Glu	Phe	Ile	Ser	Val	Gly	Gly	Asp	Gly	Arg	Met
225					230					235					240
Ser	His	Lys	Glu	Ala	Ile	Leu	Leu	Gly	Leu	Arg	Tyr	Lys	Lys	Leu	Tyr
			245						250					255	
Asn	Gln	Ala	Arg	Val	Lys	Tyr	Ser	Leu							
			260					265							

<210> 24
 <211> 265
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 24

Met	Asp	Asn	Leu	Thr	Lys	Val	Arg	Glu	Tyr	Leu	Lys	Ser	Tyr	Ser	Arg
1				5					10					15	
Leu	Asp	Gln	Ala	Val	Gly	Glu	Ile	Asp	Glu	Ile	Glu	Ala	Gln	Arg	Ala
		20						25					30		
Glu	Lys	Ser	Asn	Tyr	Glu	Leu	Phe	Gln	Glu	Asp	Gly	Val	Glu	Glu	His
	35						40					45			
Thr	Arg	Pro	Ser	Tyr	Phe	Gln	Ala	Ala	Asp	Asp	Ser	Asp	Thr	Glu	Ser
	50					55					60				
Glu	Pro	Glu	Ile	Glu	Asp	Asn	Gln	Gly	Leu	Tyr	Val	Pro	Asp	Pro	Glu
65					70					75					80
Ala	Glu	Gln	Val	Glu	Gly	Phe	Ile	Gln	Gly	Pro	Leu	Asp	Asp	Tyr	Ala
				85					90					95	
Asp	Glu	Asp	Val	Asp	Val	Val	Phe	Thr	Ser	Asp	Trp	Lys	Gln	Pro	Glu
			100					105					110		
Leu	Glu	Ser	Asp	Glu	His	Gly	Lys	Thr	Leu	Arg	Leu	Thr	Leu	Pro	Glu
		115					120					125			
Gly	Leu	Ser	Gly	Glu	Gln	Lys	Ser	Gln	Trp	Leu	Leu	Thr	Ile	Lys	Ala
	130					135					140				
Val	Val	Gln	Ser	Ala	Lys	His	Trp	Asn	Leu	Ala	Glu	Cys	Thr	Phe	Glu
145					150					155					160
Ala	Ser	Gly	Glu	Gly	Val	Ile	Ile	Lys	Lys	Arg	Gln	Ile	Thr	Pro	Asp
				165					170					175	
Val	Tyr	Lys	Val	Thr	Pro	Val	Met	Asn	Thr	His	Pro	Ser	Gln	Ser	Glu
			180					185					190		
Ala	Val	Ser	Asp	Val	Trp	Ser	Leu	Ser	Lys	Thr	Ser	Met	Thr	Phe	Gln
		195					200					205			
Pro	Lys	Lys	Ala	Ser	Leu	Gln	Pro	Leu	Thr	Ile	Ser	Leu	Asp	Glu	Leu
	210					215					220				
Phe	Ser	Ser	Arg	Gly	Glu	Phe	Ile	Ser	Val	Gly	Gly	Asn	Gly	Arg	Met
225					230					235					240
Ser	His	Lys	Glu	Ala	Ile	Leu	Leu	Gly	Leu	Arg	Tyr	Lys	Lys	Leu	Tyr
			245						250					255	
Asn	Gln	Ala	Arg	Val	Lys	Tyr	Ser	Leu							
		260						265							

<210> 25
<211> 190
<212> PRT
<213> Vesicular stomatitis virus

<400> 25

Met	Asp	Asn	Leu	Thr	Lys	Val	Arg	Glu	Tyr	Leu	Lys	Ser	Tyr	Ser	Arg
1				5					10					15	
Leu	Asp	Gln	Ala	Val	Gly	Glu	Ile	Asp	Glu	Ile	Glu	Ala	Gln	Arg	Ala
			20					25					30		
Glu	Lys	Ser	Asn	Tyr	Glu	Leu	Phe	Gln	Glu	Asp	Gly	Val	Glu	Glu	His
		35					40					45			
Thr	Arg	Pro	Ser	Tyr	Phe	Gln	Ala	Ala	Asp	Asp	Ser	Asp	Thr	Glu	Ser
	50					55					60				
Glu	Pro	Glu	Ile	Glu	Asp	Asn	Gln	Gly	Leu	Tyr	Val	Pro	Asp	Pro	Glu
65					70				75						80
Ala	Glu	Gln	Val	Glu	Gly	Phe	Ile	Gln	Gly	Pro	Leu	Asp	Asp	Tyr	Ala
				85					90					95	
Asp	Glu	Asp	Val	Asp	Val	Val	Phe	Thr	Ser	Asp	Trp	Lys	Gln	Pro	Glu
			100					105					110		
Leu	Glu	Ser	Asp	Glu	His	Gly	Lys	Thr	Leu	Arg	Leu	Thr	Leu	Pro	Glu
		115					120					125			
Gly	Leu	Ser	Gly	Glu	Gln	Lys	Ser	Gln	Trp	Leu	Leu	Thr	Ile	Lys	Ala
130						135						140			
Val	Val	Gln	Ser	Ala	Lys	His	Trp	Asn	Leu	Ala	Glu	Cys	Thr	Phe	Glu
145					150					155					160
Ala	Ser	Gly	Glu	Gly	Val	Ile	Ile	Lys	Lys	Arg	Gln	Ile	Thr	Pro	Asp
				165					170					175	
Val	Tyr	Lys	Val	Thr	Pro	Val	Met	Asn	Thr	His	Pro	Ser	Gln		
			180					185					190		

<210> 26
<211> 265
<212> PRT
<213> Vesicular stomatitis virus

<400> 26

Met	Asp	Asn	Leu	Thr	Lys	Val	Arg	Glu	Tyr	Leu	Lys	Ser	Tyr	Ser	Arg
1				5					10					15	
Leu	Asp	Gln	Ala	Val	Gly	Glu	Ile	Asp	Glu	Ile	Glu	Ala	Gln	Arg	Ala
			20					25					30		

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
 35 40 45
 Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
 50 55 60
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
 65 70 75 80
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
 85 90 95
 Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
 100 105 110
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
 115 120 125
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
 130 135 140
 Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
 145 150 155 160
 Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
 165 170 175
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
 180 185 190
 Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
 195 200 205
 Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
 210 215 220
 Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
 225 230 235 240
 Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
 245 250 255
 Asn Gln Ala Arg Val Lys Tyr Ser Leu
 260 265

<210> 28

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 28

atgagttcct taaagaagat tctcgggtctg aaggggaaag gtaagaaatc taagaaatta 60
 gggatcgcac cacccttga tgaagaggac actagcatgg agtatgctcc gagcgctcca 120
 attgacaaat cctatttttg agttgacgag atggacacct atgatccgaa tcaattaaga 180
 tatgagaaat tcttctttac agtgaaaatg acgggtagat ctaatcgtcc gttcagaaca 240

tactcagatg	tggcagccgc	tgtatcccat	tgggatcaca	tgtacatcgg	aatggcaggg	300
aaacgtccct	tctacaaaat	cttgggtttt	ttgggttctt	ctaatactaaa	ggccactcca	360
gcggtattgg	cagatcaagg	tcaaccagag	tatcacactc	actgcgaagg	cagggcttat	420
ttgccacata	ggatggggaa	gacccctccc	atgctcaatg	taccagagca	cttcagaaga	480
ccattcaata	taggtcttta	caagggaaacg	attgagctca	caatgaccat	ctacgatgat	540
gagtcactgg	aagcagctcc	tatgatctgg	gatcatttca	attcttccaa	atcttctgat	600
ttcagagaga	aggccttaat	gtttggcctg	attgtcgaga	aaaaggcatc	tggagcgtgg	660
gtcctggatt	ctatcagcca	cttcaaatga				690

<210> 29

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 29

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gggatcgac	cacccccctta	tgaagaggac	actaacatgg	agtatgctcc	gagcgctcca	120
attgacaaat	cctatctttgg	agttgacgag	atggacactc	atgatccgca	tcaattaaga	180
tatgagaaat	tcttctttac	agtgaataatg	acgggttagat	ctaatactccc	gttcagaaca	240
tactcagatg	tggcagccgc	tgtatcccat	tgggatcaca	tgtacatcgg	aatggcaggg	300
aaacgtccct	tctacaagat	cttgggtttt	ttgggttctt	ctaatactaaa	ggccactcca	360
gcggtattgg	cagatcaagg	tcaaccagag	tatcacgctc	actgtgaagg	cagggcttat	420
ttgccacaca	gaatggggaa	gacccctccc	atgctcaatg	taccagagca	cttcagaaga	480
ccattcaata	taggtcttta	caagggaaacg	gttgagctca	caatgaccat	ctacgatgat	540
gagtcactgg	aagcagctcc	tatgatctgg	gatcatttca	attcttccaa	atcttctgat	600
ttcagagaga	aggccttaat	gtttggcctg	attgtcgaga	aaaaggcatc	tggagcgtgg	660
gtcctggatt	ctgtcagcca	cttcaaatga				690

<210> 30

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 30

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gggatcgac	cacccccctta	tgaagaggac	actaacatgg	agtatgctcc	gagcgctcca	120
attgacaaat	cctatctttgg	agttgacgag	agggacactc	atgatccgca	tcaattaaga	180
tatgagaaat	tcttctttac	agtgaataatg	acgggttagat	ctaatactccc	gttcagaaca	240
tactcagatg	tggcagccgc	tgtatcccat	tgggatcaca	tgtacatcgg	aatggcaggg	300
aaacgtccct	tctacaagat	cttgggtttt	ttgggttctt	ctaatactaaa	ggccactcca	360
gcggtattgg	cagatcaagg	tcaaccagag	tatcacgctc	actgtgaagg	cagggcttat	420
ttgccacaca	gaatggggaa	gacccctccc	atgctcaatg	taccagagca	cttcagaaga	480
ccattcaata	taggtcttta	caagggaaacg	gttgagctca	caatgaccat	ctacgatgat	540
gagtcactgg	aagcagctcc	tatgatctgg	gatcatttca	attcttccaa	atcttctgat	600
ttcagagaga	aggccttaat	gtttggcctg	attgtcgaga	aaaaggcatc	tggagcgtgg	660
gtcctggatt	ctgtcagcca	cttcaaatga				690

<210> 31

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 31

atgagttcct	taaagaagat	tctcgggtctg	aaggggaaag	gtaagaaatc	taagaaatta	60
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gggatcgcac cacccttta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatcttgg agttgacgag atggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtattgg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctctcc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgtcagcca cttcaaatga 690

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<210> 32

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 32

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Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
  1             5             10             15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Ser
  20             25             30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
  35             40             45

Asp Glu Met Asp Thr Tyr Asp Pro Asn Gln Leu Arg Tyr Glu Lys Phe
  50             55             60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
  65             70             75             80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
  85             90             95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
 100             105             110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
 115             120             125

Pro Glu Tyr His Thr His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
 130             135             140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
 145             150             155             160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Ile Glu Leu Thr Met Thr
 165             170             175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
 180             185             190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
 195             200             205

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Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
 210 215 220

Ile Ser His Phe Lys
 225

<210> 33

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 33

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
 1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
 20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
 35 40 45

Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
 50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
 65 70 75 80

Tyr Ser Asp Val Ala Ala Val Ser His Trp Asp His Met Tyr Ile
 85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
 100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
 115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
 130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
 145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
 165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
 180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
 195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
 210 215 220

Val Ser His Phe Lys
225

```
<210> 34
<211> 229
<212> PRT
<213> Vesicular stomatitis virus
```

```

<400> 34
Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
  1          5          10          15
Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
  20          25          30
Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
  35          40          45
Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
  50          55          60
Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
  65          70          75          80
Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
  85          90          95
Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
  100          105          110
Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
  115          120          125
Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
  130          135          140
Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
  145          150          155          160
Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
  165          170          175
Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
  180          185          190
Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
  195          200          205
Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
  210          215          220
Val Ser His Phe Lys
225

```


<210> 36
<211> 1536
<212> DNA
<213> Vesicular stomatitis virus

```
<400> 36
atgaagtgcc ttttgtactt agccttttta ttcattgggg tgaattgcaa gttcaccata 60
gtttttccac acaacccaaa aggaaactgg aaaaatgttc cttctaatta ccattattgc 120
ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagccat acaagtcaaa 180
atgcccaga gtcacaaggc tattcaagca gacggttga tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtatgga ccgaagtata taacacagtc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgccgaagca 420
gtgattgtcc aggtgactcc tcaccatgtg ctggttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aattacatat gccccactgt ccataactct 540
acaacctggc attctgacta taaggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc tgggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggaggcaagg cctgcaaaat gcaatactgc 720
aagcattggg gagtcagact cccatcaggt gtctgggtcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct aattcaggac gttgagagga tcttgatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttccaatct ctccagtga tctcagctat 960
cttgcctcta aaaaccagg aaccggctct gctttcacca taatcaatgg taccctaaa 1020
tactttgaga ccagatacat cagagtcgat attgctgctc caatcctctc aagaatgggtc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc accatatgaa 1140
gacgtggaaa ttggacccaa tggagttctg aggaccagtt caggatataa gtttccttta 1200
tacatgattg gacatggtat gttggactcc gatcttcac ttagctcaaa ggctcaggtg 1260
ttcgaacatc ctcacattca agacgtctgt tcgcaacttc ctgatgatga gagtttattt 1320
tttggtgata ctgggctatc caaaaatcca atcgagcttg tagaaggttg gttcagtagt 1380
tggaagagct ctattgcctc ttttttcttt atcatagggg taatcattgg actattcttg 1440
gttctccgag ttggtatcca tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacacaca tagagatgaa ccgacttggg aagtaa 1536
```

<210> 37
<211> 885
<212> DNA
<213> Vesicular stomatitis virus

<220>
<221> modified_base
<222> (1)..(885)
<223> "n" represents a, t, c, g, other or unknown

```
<400> 37
atgaagtgcc ttttgcactt agctttttta ttcacggggg tgaattgcaa gttcaccata 60
gtttttccat acaacccaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagattttaa ttgncataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaga gtcacaaggc tattcaagca gacggttga tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gccccactgt ccataactcc 540
acaacctggc attccgacta taaggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
```

aagcgttggg	gagtcagact	cccatcaggt	gtctggttcg	agatggctga	taaggatctc	780
tttgctgcag	ccagattccc	tgaatgccc	gaagggtcaa	gtatctctgc	tccatctcag	840
acctcagtgg	atgtaagtct	cattcaggac	gttgagagga	tcttg		885

<210> 38
 <211> 705
 <212> DNA
 <213> Vesicular stomatitis virus

<400> 38						
ccatctcaga	cctcagtggg	tgtaagtctc	attcaggacg	ttgagaggat	cttggattat	60
tccctctgcc	aagaaacctg	gagcaaatc	agagcgggtc	ttcccatctc	tccagtggat	120
ctcagctatc	ttgctcctaa	aaaccagga	accggtcctg	tctttaccat	aatcaatggt	180
accctaaaat	actttgagac	cagatacatc	agagtcgata	ttgctgctcc	aatcctctca	240
agaatggtcg	gaatgatcag	tggaaactacc	acagaaaagg	aactgtggga	tgactgggct	300
ccatatgaag	acgtggaaat	tggacccaat	ggagttctga	ggaccagttc	aggatataag	360
tttcctttat	atatgattgg	acatggtatg	ttggactccg	atcttcatct	tagctcaaag	420
gctcaggtgt	ttgaacatcc	tcacattcaa	gacgctgctt	cgcagcttcc	tgatgatgag	480
actttatttt	ttggtgatac	tgggctatcc	aaaaatccaa	tcgagtttgt	agaaggttgg	540
ttcagtagtt	ggaagagctc	tattgcctct	tttttcttta	tcatagggtt	aatcattgga	600
ctattcttgg	ttctccgagt	tggtatttat	ctttgcatta	aattaaagca	caccaagaaa	660
agacagattt	atacagacat	agagatgaac	cgacttggga	agtaa		705

<210> 39
 <211> 1536
 <212> DNA
 <213> Vesicular stomatitis virus

<400> 39						
atgaagtgcc	ttttgtactt	agctttttta	ttcatcgggg	tgaattgcaa	gttcaccata	60
gtttttccat	acaaccgaaa	aggaaactgg	aaaaatgttc	cttccaatta	ccattattgc	120
ccgtcaagct	cagattttaa	ttggcataat	gacttaatag	gcacagcctt	acaagtcaa	180
atgccaaga	gtcacaaggc	tattcaagca	gacggttggg	tgtgtcatgc	ttccaaatgg	240
gtcactactt	gtgatttccg	ctggtacgga	ccgaagtata	taacacattc	catccgatcc	300
ttcactccat	ctgtagaaca	atgcaaggaa	agcattgaac	aaacgaaaca	aggaacttgg	360
ctgaatccag	gcttccctcc	tcaaagtgtg	ggatatgcaa	ctgtgacgga	tgctgaagca	420
gcgattgtcc	aggtgactcc	tcaccatgtg	cttggtgatg	aatacacagg	agaatgggtt	480
gattcacagt	tcatacaacg	aaaatgcagc	aatgacatat	gccccactgt	ccataactcc	540
acaacctggc	attccgacta	taagggtcaa	gggctatgtg	attctaacct	catttccatg	600
gacatcacct	tcttctcaga	ggacggagag	ctatcatccc	taggaaagga	gggcacaggg	660
ttcagaagta	actactttgc	ttatgaaact	ggagacaagg	cctgcaaaat	gcagtactgc	720
aagcattggg	gagtcagact	cccatcaggt	gtctggttcg	agatggctga	taaggatctc	780
tttgctgcag	ccagattccc	tgaatgccc	gaagggtcaa	gtatctctgc	tccatctcag	840
acctcagtgg	atgtaagtct	cattcaggac	gttgagagga	tcttgatta	ttccctctgc	900
caagaaacct	ggagcaaaat	cagagcgggt	cttcccatct	ctccagtggg	tctcagctat	960
cttgctccta	aaaaccaggg	aaccggtcct	gctttcacca	taatcaatgg	taccctaaaa	1020
tactttgaga	ccagatacat	cagagtcatg	attgctgctc	caatcctctc	aagaatgggtc	1080
ggaatgatca	gtggaactac	cacagaaagg	gaactgtggg	atgactgggc	tccatatgaa	1140
gacgtggaaa	ttggacccaa	tggagtcttg	aggaccagtt	caggatataa	gtttccttta	1200
tatatgattg	gacatggtat	gttgactcc	gatcttcac	ttagctcaaa	ggctcaggtg	1260
tttgaacatc	ctcacattca	agacgctght	gcgcagcttc	ctgatgatga	gactttatct	1320
tttggtgata	ctgggctatc	caaaaatcca	atcgagtttg	tagaaggttg	gttcagtagt	1380
tggaagagct	ctattgcctc	tttttctttt	atcatagggt	taatcattgg	actattcttg	1440
gttctccgag	ttggtattta	tctttgcatt	aaattaaagc	acaccaagaa	aagacagatt	1500
tatacagaca	tagagatgaa	ccgacttggg	aagtaa			1536

<210> 40
 <211> 1399
 <212> DNA
 <213> Vesicular stomatitis virus

<400> 40
 atgaagtgcc ttttgtactt agcttttttta ttcacgcggg tgaattgcaa gttcaccata 60
 gtttttccat acaacccaaaa aggaaaactgg aaaaatgttc cttccaatta ccattattgc 120
 ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagcctt acaggtcaaa 180
 atgcccaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240
 gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
 ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
 ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
 gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
 gattcacagt tcatcaacgg aaaatgcagc aatgacatat gcccactgt ccataactcc 540
 acaacctggc attccgacta taagggtcaaa gggctatgtg attctaacct catttccatg 600
 gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
 ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
 aagcgttggg gagtcagact cccatcaggt gtctgggtcg ggatggctga taaggatctc 780
 tttgctgcag ccagattccc tgaatgcccc gaagggtcaa gtatctctgc tccatctcag 840
 acctcagtgg atgtaagtct cattcaggac gttgagagga tcttactttg agaccagata 900
 catcagagtc gatattgctg ctccaatcct ctcaagaatg gtcggaatga tcagtggaac 960
 taccacagaa agggaactgt gggatgactg ggctccatat gaagacgtgg aaattggacc 1020
 caatggagtt ctgaggacca gttcaggata taagtttcct ttatatatga ttggacatgg 1080
 tatgttggac tccgatcttc atcttagctc aaaggctcag gtgtttgaac atcctcacat 1140
 tcaagacgct gcttcgcagc ttctgatga tgagacttta ttttttgggtg atactgggct 1200
 atccaaaaat ccaatcgagt ttgtagaagg ttggttcagt agttggaaga gctctattgc 1260
 ctcttttttc tttatcatag ggtaatcat tggactattc ttggttctcc gagttggtat 1320
 ttatctttgc attaaattaa agcacaccaa gaaaagacag atttatacag acatagagat 1380
 gaaccgactt ggggaagtaa 1399

<210> 41
 <211> 511
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 41
 Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
 1 5 10 15
 Lys Phe Thr Ile Val Phe Pro His Asn Gln Lys Gly Asn Trp Lys Asn
 20 25 30
 Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
 35 40 45
 His Asn Asp Leu Ile Gly Thr Ala Ile Gln Val Lys Met Pro Lys Ser
 50 55 60
 His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
 65 70 75 80
 Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr Gln
 85 90 95

Ser	Ile	Arg	Ser	Phe	Thr	Pro	Ser	Val	Glu	Gln	Cys	Lys	Glu	Ser	Ile	100	105	110	
Glu	Gln	Thr	Lys	Gln	Gly	Thr	Trp	Leu	Asn	Pro	Gly	Phe	Pro	Pro	Gln	115	120	125	
Ser	Cys	Gly	Tyr	Ala	Thr	Val	Thr	Asp	Ala	Glu	Ala	Val	Ile	Val	Gln	130	135	140	
Val	Thr	Pro	His	His	Val	Leu	Val	Asp	Glu	Tyr	Thr	Gly	Glu	Trp	Val	145	150	155	160
Asp	Ser	Gln	Phe	Ile	Asn	Gly	Lys	Cys	Ser	Asn	Tyr	Ile	Cys	Pro	Thr	165	170	175	
Val	His	Asn	Ser	Thr	Thr	Trp	His	Ser	Asp	Tyr	Lys	Val	Lys	Gly	Leu	180	185	190	
Cys	Asp	Ser	Asn	Leu	Ile	Ser	Met	Asp	Ile	Thr	Phe	Phe	Ser	Glu	Asp	195	200	205	
Gly	Glu	Leu	Ser	Ser	Leu	Gly	Lys	Glu	Gly	Thr	Gly	Phe	Arg	Ser	Asn	210	215	220	
Tyr	Phe	Ala	Tyr	Glu	Thr	Gly	Gly	Lys	Ala	Cys	Lys	Met	Gln	Tyr	Cys	225	230	235	240
Lys	His	Trp	Gly	Val	Arg	Leu	Pro	Ser	Gly	Val	Trp	Phe	Glu	Met	Ala	245	250	255	
Asp	Lys	Asp	Leu	Phe	Ala	Ala	Ala	Arg	Phe	Pro	Glu	Cys	Pro	Glu	Gly	260	265	270	
Ser	Ser	Ile	Ser	Ala	Pro	Ser	Gln	Thr	Ser	Val	Asp	Val	Ser	Leu	Ile	275	280	285	
Gln	Asp	Val	Glu	Arg	Ile	Leu	Asp	Tyr	Ser	Leu	Cys	Gln	Glu	Thr	Trp	290	295	300	
Ser	Lys	Ile	Arg	Ala	Gly	Leu	Pro	Ile	Ser	Pro	Val	Asp	Leu	Ser	Tyr	305	310	315	320
Leu	Ala	Pro	Lys	Asn	Pro	Gly	Thr	Gly	Pro	Ala	Phe	Thr	Ile	Ile	Asn	325	330	335	
Gly	Thr	Leu	Lys	Tyr	Phe	Glu	Thr	Arg	Tyr	Ile	Arg	Val	Asp	Ile	Ala	340	345	350	
Ala	Pro	Ile	Leu	Ser	Arg	Met	Val	Gly	Met	Ile	Ser	Gly	Thr	Thr	Thr	355	360	365	
Glu	Arg	Glu	Leu	Trp	Asp	Asp	Trp	Ala	Pro	Tyr	Glu	Asp	Val	Glu	Ile	370	375	380	
Gly	Pro	Asn	Gly	Val	Leu	Arg	Thr	Ser	Ser	Gly	Tyr	Lys	Phe	Pro	Leu	385	390	395	400

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln
 130 135 140
 Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val
 145 150 155 160
 Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr
 165 170 175
 Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
 180 185 190
 Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
 195 200 205
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn
 210 215 220
 Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys
 225 230 235 240
 Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala
 245 250 255
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly
 260 265 270
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile
 275 280 285
 Gln Asp Val Glu Arg Ile Leu
 290 295

<210> 43
 <211> 234
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 43
 Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile Gln Asp Val Glu Arg
 1 5 10 15
 Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp Ser Lys Ile Arg Ala
 20 25 30
 Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr Leu Ala Pro Lys Asn
 35 40 45
 Pro Gly Thr Gly Pro Val Phe Thr Ile Ile Asn Gly Thr Leu Lys Tyr
 50 55 60
 Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala Ala Pro Ile Leu Ser
 65 70 75 80

Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr Glu Arg Glu Leu Trp
 85 90 95
 Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile Gly Pro Asn Gly Val
 100 105 110
 Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu Tyr Met Ile Gly His
 115 120 125
 Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser Lys Ala Gln Val Phe
 130 135 140
 Glu His Pro His Ile Gln Asp Ala Ala Ser Gln Leu Pro Asp Asp Glu
 145 150 155 160
 Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys Asn Pro Ile Glu Phe
 165 170 175
 Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser Ile Ala Ser Phe Phe
 180 185 190
 Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu Val Leu Arg Val Gly
 195 200 205
 Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys Lys Arg Gln Ile Tyr
 210 215 220
 Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
 225 230

<210> 44
 <211> 511
 <212> PRT
 <213> Vesicular stomatitis virus

 <220>
 <221> MOD_RES
 <222> (1)..(511)
 <223> "Xaa" represents any, other or unknown amino acid

<400> 44
 Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
 1 5 10 15
 Lys Phe Thr Ile Val Phe Pro Tyr Asn Arg Lys Gly Asn Trp Lys Asn
 20 25 30
 Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
 35 40 45
 His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
 50 55 60
 His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
 65 70 75 80

Val	Thr	Thr	Cys	Asp	Phe	Arg	Trp	Tyr	Gly	Pro	Lys	Tyr	Ile	Thr	His	
				85					90					95		
Ser	Ile	Arg	Ser	Phe	Thr	Pro	Ser	Val	Glu	Gln	Cys	Lys	Glu	Ser	Ile	
			100					105					110			
Glu	Gln	Thr	Lys	Gln	Gly	Thr	Trp	Leu	Asn	Pro	Gly	Phe	Pro	Pro	Gln	
		115					120					125				
Ser	Cys	Gly	Tyr	Ala	Thr	Val	Thr	Asp	Ala	Glu	Ala	Ala	Ile	Val	Gln	
	130					135					140					
Val	Thr	Pro	His	His	Val	Leu	Val	Asp	Glu	Tyr	Thr	Gly	Glu	Trp	Val	
145					150					155					160	
Asp	Ser	Gln	Phe	Ile	Asn	Gly	Lys	Cys	Ser	Asn	Asp	Ile	Cys	Pro	Thr	
			165					170						175		
Val	His	Asn	Ser	Thr	Thr	Trp	His	Ser	Asp	Tyr	Lys	Val	Lys	Gly	Leu	
		180						185					190			
Cys	Asp	Ser	Asn	Leu	Ile	Ser	Met	Asp	Ile	Thr	Phe	Phe	Ser	Glu	Asp	
		195					200					205				
Gly	Glu	Leu	Ser	Ser	Leu	Gly	Lys	Glu	Gly	Thr	Gly	Phe	Arg	Ser	Asn	
	210					215					220					
Tyr	Phe	Ala	Tyr	Glu	Thr	Gly	Asp	Lys	Ala	Cys	Lys	Met	Gln	Tyr	Cys	
225					230					235					240	
Lys	His	Trp	Gly	Val	Arg	Leu	Pro	Ser	Gly	Val	Trp	Phe	Glu	Met	Ala	
			245						250					255		
Asp	Lys	Asp	Leu	Phe	Ala	Ala	Ala	Arg	Phe	Pro	Glu	Cys	Pro	Glu	Gly	
			260					265					270			
Ser	Ser	Ile	Ser	Ala	Pro	Ser	Gln	Thr	Ser	Val	Asp	Val	Ser	Leu	Ile	
		275					280					285				
Gln	Asp	Val	Glu	Arg	Ile	Leu	Asp	Tyr	Ser	Leu	Cys	Gln	Glu	Thr	Trp	
	290					295					300					
Ser	Lys	Ile	Arg	Ala	Gly	Leu	Pro	Ile	Ser	Pro	Val	Asp	Leu	Ser	Tyr	
305					310					315					320	
Leu	Ala	Pro	Lys	Asn	Pro	Gly	Thr	Gly	Pro	Ala	Phe	Thr	Ile	Ile	Asn	
				325					330					335		
Gly	Thr	Leu	Lys	Tyr	Phe	Glu	Thr	Arg	Tyr	Ile	Arg	Val	Asp	Ile	Ala	
		340						345					350			
Ala	Pro	Ile	Leu	Ser	Arg	Met	Val	Gly	Met	Ile	Ser	Gly	Thr	Thr	Thr	
		355					360					365				
Glu	Arg	Glu	Leu	Trp	Asp	Asp	Trp	Ala	Pro	Tyr	Glu	Asp	Val	Glu	Ile	
	370					375					380					

Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu
 385 390 395 400
 Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser
 405 410 415
 Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Xaa Ala Gln
 420 425 430
 Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys
 435 440 445
 Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser
 450 455 460
 Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu
 465 470 475 480
 Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys
 485 490 495
 Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
 500 505 510

<210> 45
 <211> 465
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 45
 Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
 1 5 10 15
 Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn
 20 25 30
 Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
 35 40 45
 His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
 50 55 60
 His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
 65 70 75 80
 Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
 85 90 95
 Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
 100 105 110
 Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
 115 120 125
 Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln
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 <211> 6330
 <212> DNA
 <213> Vesicular stomatitis virus

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<211> 5327

<212> DNA

<213> Vesicular stomatitis virus

<400> 47

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<210> 48

<211> 348

<212> DNA

<213> Vesicular stomatitis virus

<400> 48

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ccgattccct cgatgtggga tagtaagaac tgggatggag ttcttgagat gttaacatca 240
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<210> 49
<211> 6330
<212> DNA
<213> Vesicular stomatitis virus

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<223> "n" represents a, t, c, g, other or unknown

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<210> 50

<211> 2109

<212> PRT

<213> Vesicular stomatitis virus

<400> 50

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Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr
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Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp
      35                      40                     45

Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser
      50                      55                     60

Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser
      65                      70                     75                     80

Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly
      85                      90                     95

Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe
      100                     105                    110

Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu
      115                     120                    125

Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys
      130                     135                    140

Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys
      145                     150                    155                    160

Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu
      165                     170                    175

Val Glu Leu Leu Asn Leu Ala Arg Thr Phe Lys Gly Lys Val Arg Arg
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Ser Ser His Gly Thr Asn Ile Cys Arg Ile Arg Val Pro Ser Leu Gly
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Pro Thr Phe Ile Ser Glu Gly Trp Ala Tyr Phe Lys Lys Leu Asp Ile
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Pro	His	Asp	His	Pro	Phe	Lys	Ser	His	Val	Lys	Glu	Asn	Thr	Trp	Pro	
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Tyr	Ser	Asp	Lys	Ser	His	Ser	Met	Asn	Arg	Ser	Glu	Val	Leu	Lys	His	
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Leu	Phe	Pro	Arg	Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly	1010	1015	1020	
Val	Ala	Asp	Gly	Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg	1025	1030	1035	1040
Asn	Ser	Phe	Lys	Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val	1045	1050	1055	
Arg	Ser	Glu	Val	Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg	1060	1065	1070	
Arg	Gly	Ser	Cys	Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr	1075	1080	1085	
Leu	Arg	Tyr	Lys	Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro	1090	1095	1100	
His	Pro	Leu	Glu	Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys	1105	1110	1115	1120
Ala	Pro	Cys	Asn	Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro	1125	1130	1135	

Asp Gly Ile His	Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr
1140	1145 1150
Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu	
1155	1160 1165
Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp	
1170	1175 1180
Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile	
1185	1190 1195 1200
Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln	
1205	1210 1215
His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser	
1220	1225 1230
Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr	
1235	1240 1245
Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn	
1250	1255 1260
Phe Asp Phe Leu Phe Gln Ala Thr Leu Leu Tyr Ala Gln Ile Thr Thr	
1265	1270 1275 1280
Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His	
1285	1290 1295
Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp	
1300	1305 1310
Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr	
1315	1320 1325
Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr	
1330	1335 1340
Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr	
1345	1350 1355 1360
Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg	
1365	1370 1375
Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln	
1380	1385 1390
Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu	
1395	1400 1405
Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His	
1410	1415 1420
Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile	
1425	1430 1435 1440

Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly
 1445 1450 1455
 Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser
 1460 1465 1470
 Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe
 1475 1480 1485
 Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr
 1490 1495 1500
 Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly
 1505 1510 1515 1520
 Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe
 1525 1530 1535
 Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser
 1540 1545 1550
 Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe
 1555 1560 1565
 Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys
 1570 1575 1580
 Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro
 1585 1590 1595 1600
 Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr
 1605 1610 1615
 Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln
 1620 1625 1630
 Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala
 1635 1640 1645
 His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg
 1650 1655 1660
 Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu
 1665 1670 1675 1680
 Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu
 1685 1690 1695
 Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala
 1700 1705 1710
 Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr
 1715 1720 1725
 Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr
 1730 1735 1740

Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val
1745 1750 1755 1760
Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr
1765 1770 1775
Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu
1780 1785 1790
Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala
1795 1800 1805
Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr
1810 1815 1820
Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly
1825 1830 1835 1840
Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn
1845 1850 1855
Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe
1860 1865 1870
Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro
1875 1880 1885
Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln
1890 1895 1900
Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser
1905 1910 1915 1920
Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala
1925 1930 1935
Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro
1940 1945 1950
Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile
1955 1960 1965
Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu
1970 1975 1980
Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp
1985 1990 1995 2000
Glu Ala Val Ser Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg
2005 2010 2015
Gly Asp Gly Leu Pro Lys Asp Thr Arg Thr Ser Asp Ser Leu Ala Pro
2020 2025 2030
Ile Gly Asn Trp Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg
2035 2040 2045

Leu Asn Pro Phe Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val
2050 2055 2060

Asp Asn His Leu Lys Trp Ser Asn Leu Arg Arg Asn Thr Gly Met Ile
2065 2070 2075 2080

Glu Trp Ile Asn Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met
2085 2090 2095

Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp
2100 2105

<210> 51

<211> 1753

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(1753)

<223> "Xaa" represents any, other or unknown amino acid

<400> 51

His Trp Gly His Pro Phe Ile Asp Tyr Tyr Ala Gly Leu Glu Lys Leu
1 5 10 15

His Ser Gln Val Thr Xaa Lys Lys Asp Ile Asp Val Ser Tyr Ala Lys
20 25 30

Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe Gln Gln Phe Asn
35 40 45

Asp His Xaa Lys Trp Phe Val Asn Gly Asp Leu Leu Pro His Asp His
50 55 60

Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro Thr Ala Ala Gln
65 70 75 80

Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro Leu Ile Lys Cys
85 90 95

Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile Tyr Ser Asp Lys
100 105 110

Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His Val Arg Met Asn
115 120 125

Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln Thr Met Leu Asp
130 135 140

Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu Ile Asp Glu Lys
145 150 155 160

Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys Gly Lys Glu Arg
165 170 175

Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met	Ser	Trp	Lys	Leu	180	185	190	
Arg	Glu	Tyr	Phe	Val	Ile	Thr	Glu	Tyr	Leu	Ile	Lys	Thr	His	Phe	Val	195	200	205	
Pro	Met	Phe	Lys	Gly	Leu	Thr	Met	Ala	Asp	Asp	Leu	Thr	Ala	Val	Ile	210	215	220	
Lys	Lys	Met	Leu	Asp	Ser	Ser	Ser	Gly	Gln	Gly	Leu	Lys	Ser	Tyr	Glu	225	230	235	240
Ala	Ile	Cys	Ile	Ala	Asn	His	Ile	Asp	Tyr	Glu	Lys	Trp	Asn	Asn	His	245	250	255	
Gln	Arg	Lys	Leu	Ser	Asn	Gly	Pro	Val	Phe	Arg	Val	Met	Gly	Gln	Phe	260	265	270	
Leu	Gly	Tyr	Pro	Ser	Leu	Ile	Glu	Arg	Thr	His	Glu	Phe	Phe	Glu	Lys	275	280	285	
Ser	Leu	Ile	Tyr	Tyr	Asn	Gly	Arg	Pro	Asp	Leu	Met	Arg	Val	His	Asn	290	295	300	
Asn	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val	Cys	Trp	Gln	Gly	Gln	305	310	315	320
Glu	Gly	Gly	Leu	Glu	Gly	Leu	Arg	Gln	Lys	Gly	Trp	Ser	Ile	Leu	Asn	325	330	335	
Leu	Leu	Val	Ile	Gln	Arg	Glu	Ala	Lys	Ile	Arg	Asn	Thr	Ala	Val	Lys	340	345	350	
Val	Leu	Ala	Gln	Gly	Asp	Asn	Gln	Val	Ile	Cys	Thr	Gln	Tyr	Lys	Thr	355	360	365	
Lys	Lys	Ser	Arg	Asn	Val	Val	Glu	Leu	Gln	Gly	Ala	Leu	Asn	Gln	Met	370	375	380	
Val	Ser	Asn	Asn	Glu	Lys	Ile	Met	Thr	Ala	Ile	Lys	Ile	Gly	Thr	Gly	385	390	395	400
Lys	Leu	Gly	Leu	Leu	Ile	Asn	Asp	Asp	Glu	Thr	Met	Gln	Ser	Ala	Asp	405	410	415	
Tyr	Leu	Asn	Tyr	Gly	Lys	Ile	Pro	Ile	Phe	Arg	Gly	Val	Ile	Arg	Gly	420	425	430	
Leu	Glu	Thr	Lys	Arg	Trp	Ser	Arg	Val	Thr	Cys	Val	Thr	Asn	Asp	Gln	435	440	445	
Ile	Pro	Thr	Cys	Ala	Asn	Ile	Met	Ser	Ser	Val	Ser	Thr	Asn	Ala	Leu	450	455	460	
Thr	Val	Ala	His	Phe	Ala	Glu	Asn	Pro	Ile	Asn	Ala	Met	Ile	Gln	Tyr	465	470	475	480

Asn	Tyr	Phe	Gly	Thr	Phe	Ala	Arg	Leu	Leu	Leu	Met	Met	His	Asp	Pro		
				485					490					495			
Ala	Leu	Arg	Gln	Ser	Leu	Tyr	Glu	Val	Gln	Asp	Lys	Ile	Pro	Gly	Leu		
			500					505					510				
His	Ser	Ser	Thr	Phe	Lys	Tyr	Ala	Met	Leu	Tyr	Leu	Asp	Pro	Ser	Ile		
		515					520					525					
Gly	Gly	Val	Ser	Gly	Met	Ser	Leu	Ser	Arg	Phe	Leu	Ile	Arg	Ala	Phe		
	530					535					540						
Pro	Asp	Pro	Val	Thr	Glu	Ser	Leu	Ser	Phe	Trp	Arg	Phe	Ile	His	Val		
545					550					555					560		
His	Ala	Arg	Ser	Glu	His	Leu	Lys	Glu	Met	Ser	Ala	Val	Phe	Gly	Asn		
				565					570					575			
Pro	Glu	Ile	Ala	Lys	Phe	Arg	Ile	Thr	His	Ile	Asp	Lys	Leu	Val	Glu		
			580					585					590				
Asp	Pro	Thr	Ser	Leu	Asn	Ile	Ala	Met	Gly	Met	Ser	Pro	Ala	Asn	Leu		
		595					600					605					
Leu	Lys	Thr	Glu	Val	Lys	Lys	Cys	Leu	Ile	Glu	Ser	Arg	Gln	Thr	Ile		
	610					615					620						
Arg	Asn	Gln	Val	Ile	Lys	Asp	Ala	Thr	Ile	Tyr	Leu	Tyr	His	Glu	Glu		
625					630					635					640		
Asp	Arg	Leu	Arg	Ser	Phe	Leu	Trp	Ser	Ile	Asn	Pro	Leu	Phe	Pro	Arg		
				645					650					655			
Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly	Val	Ala	Asp	Gly		
			660					665						670			
Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg	Asn	Ser	Phe	Lys		
		675					680					685					
Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val	Arg	Ser	Glu	Val		
	690					695					700						
Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg	Arg	Gly	Ser	Cys		
705					710					715					720		
Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr	Leu	Arg	Tyr	Lys		
				725					730					735			
Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro	His	Pro	Leu	Glu		
			740					745					750				
Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys	Ala	Pro	Cys	Asn		
		755					760					765					
Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro	Asp	Gly	Ile	His		
		770				775					780						

Asp	Val	Phe	Ser	Ser	Arg	Gly	Pro	Leu	Pro	Ala	Tyr	Leu	Gly	Ser	Lys	785	790	795	800
Thr	Ser	Glu	Ser	Thr	Ser	Ile	Leu	Gln	Pro	Trp	Glu	Arg	Glu	Ser	Lys	805	810	815	
Val	Pro	Leu	Ile	Lys	Arg	Ala	Thr	Arg	Leu	Arg	Asp	Ala	Ile	Ser	Trp	820	825	830	
Phe	Val	Glu	Pro	Asp	Ser	Lys	Leu	Ala	Met	Thr	Ile	Leu	Ser	Asn	Ile	835	840	845	
His	Ser	Leu	Thr	Gly	Glu	Glu	Trp	Thr	Lys	Arg	Gln	His	Gly	Phe	Lys	850	855	860	
Arg	Thr	Gly	Ser	Ala	Leu	His	Arg	Phe	Ser	Thr	Ser	Arg	Met	Ser	His	865	870	875	880
Gly	Gly	Phe	Ala	Ser	Gln	Ser	Thr	Ala	Ala	Leu	Thr	Arg	Leu	Met	Ala	885	890	895	
Thr	Thr	Asp	Thr	Met	Arg	Asp	Leu	Gly	Asp	Gln	Asn	Phe	Asp	Phe	Leu	900	905	910	
Phe	Gln	Ala	Thr	Leu	Leu	Tyr	Ala	Gln	Ile	Thr	Thr	Thr	Val	Ala	Arg	915	920	925	
Asp	Gly	Trp	Ile	Thr	Ser	Cys	Thr	Asp	His	Tyr	His	Ile	Ala	Cys	Lys	930	935	940	
Ser	Cys	Leu	Arg	Pro	Ile	Glu	Glu	Ile	Thr	Leu	Asp	Ser	Ser	Met	Asp	945	950	955	960
Tyr	Thr	Pro	Pro	Asp	Val	Ser	His	Val	Leu	Lys	Thr	Trp	Arg	Asn	Gly	965	970	975	
Glu	Gly	Ser	Trp	Gly	Gln	Glu	Ile	Lys	Gln	Ile	Tyr	Pro	Leu	Glu	Gly	980	985	990	
Asn	Trp	Lys	Asn	Leu	Ala	Pro	Ala	Glu	Gln	Ser	Tyr	Gln	Val	Gly	Arg	995	1000	1005	
Cys	Ile	Gly	Phe	Leu	Tyr	Gly	Asp	Leu	Ala	Tyr	Arg	Lys	Ser	Thr	His	1010	1015	1020	
Ala	Glu	Asp	Ser	Ser	Leu	Phe	Pro	Leu	Ser	Ile	Gln	Gly	Arg	Ile	Arg	1025	1030	1035	1040
Gly	Arg	Gly	Phe	Leu	Lys	Gly	Leu	Leu	Asp	Gly	Leu	Met	Arg	Ala	Ser	1045	1050	1055	
Cys	Cys	Gln	Val	Ile	His	Arg	Arg	Ser	Leu	Ala	His	Leu	Lys	Arg	Pro	1060	1065	1070	
Ala	Asn	Ala	Val	Tyr	Gly	Gly	Leu	Ile	Tyr	Leu	Ile	Asp	Lys	Leu	Ser	1075	1080	1085	

Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly Pro Ile Arg Asp
 1090 1095 1100
 Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser Tyr Pro Thr Ser
 1105 1110 1115 1120
 Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe Lys Tyr Gln Cys
 1125 1130 1135
 Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr Ser Gln Leu Trp
 1140 1145 1150
 Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly Pro Phe Ser Ile
 1155 1160 1165
 Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe Leu Ser Gly Lys
 1170 1175 1180
 Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser Ser Leu Leu Arg
 1185 1190 1195 1200
 Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe Phe Thr Lys Asp
 1205 1210 1215
 Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys Lys Phe Gly Ile
 1220 1225 1230
 Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro Trp Gly Arg Glu
 1235 1240 1245
 Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr Thr Thr Thr Pro
 1250 1255 1260
 Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln Asn Pro Leu Leu
 1265 1270 1275 1280
 Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala His Tyr Lys Ile
 1285 1290 1295
 Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg Asp Phe Leu Ser
 1300 1305 1310
 Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu Leu Arg Glu Asn
 1315 1320 1325
 Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu Leu Ser Gly Ser
 1330 1335 1340
 Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala Leu Glu Thr Leu
 1345 1350 1355 1360
 Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr Cys Trp Glu Tyr
 1365 1370 1375
 Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr Phe Leu Arg Leu
 1380 1385 1390

Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val Met Asp Met Glu
 1395 1400 1405
 Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr Asn Val Arg Asn
 1410 1415 1420
 Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu Ile Tyr Lys Thr
 1425 1430 1435 1440
 Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala Val Thr Ile Leu
 1445 1450 1455
 Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr Glu Phe Ser Ser
 1460 1465 1470
 Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly Leu Lys Lys Leu
 1475 1480 1485
 Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn Glu Ser Trp Lys
 1490 1495 1500
 Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe Ala Arg Ala Lys
 1505 1510 1515 1520
 Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro Ser Gln Phe Ile
 1525 1530 1535
 Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln Ile Phe Gly Val
 1540 1545 1550
 Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser Ser Asp Arg Pro
 1555 1560 1565
 Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala Ile Ile Ser Tyr
 1570 1575 1580
 Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro Pro Asn Pro Pro
 1585 1590 1595 1600
 Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile Thr Gly Ile Ser
 1605 1610 1615
 Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu Tyr Gln Gln Cys
 1620 1625 1630
 Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp Glu Ala Val Ser
 1635 1640 1645
 Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg Gly Asp Gly Leu
 1650 1655 1660
 Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro Ile Gly Asn Trp
 1665 1670 1675 1680
 Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg Leu Asn Pro Phe
 1685 1690 1695

Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val Asp Asn His Leu
 1700 1705 1710
 Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile Glu Trp Ile Asn
 1715 1720 1725
 Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met Leu Lys Ser Asp
 1730 1735 1740
 Leu His Glu Glu Asn Ser Trp Arg Asp
 1745 1750

<210> 52
 <211> 2109
 <212> PRT
 <213> Vesicular stomatitis virus

<220>
 <221> MOD_RES
 <222> (1)..(2109)
 <223> "Xaa" represents any, other or unknown amino acid

<400> 52
 Met Glu Val His Asp Phe Glu Thr Asp Glu Phe Asn Asp Phe Asn Glu
 1 5 10 15
 Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr
 20 25 30
 Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp
 35 40 45
 Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser
 50 55 60
 Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser
 65 70 75 80
 Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly
 85 90 95
 Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe
 100 105 110
 Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu
 115 120 125
 Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys
 130 135 140
 Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys
 145 150 155 160
 Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu
 165 170 175

Val	Glu	Leu	Leu	Asn	Leu	Ala	Arg	Thr	Phe	Lys	Gly	Lys	Val	Arg	Arg		
			180					185					190				
Ser	Ser	His	Gly	Thr	Asn	Ile	Cys	Arg	Leu	Arg	Val	Pro	Ser	Leu	Gly		
		195					200					205					
Pro	Thr	Phe	Ile	Ser	Glu	Gly	Trp	Ala	Tyr	Phe	Lys	Lys	Leu	Asp	Ile		
	210					215					220						
Leu	Met	Asp	Arg	Asn	Phe	Leu	Leu	Met	Val	Lys	Asp	Val	Ile	Ile	Gly		
225					230					235					240		
Arg	Met	Gln	Thr	Val	Leu	Ser	Met	Val	Cys	Arg	Ile	Asp	Asn	Leu	Phe		
			245						250					255			
Ser	Glu	Gln	Asp	Ile	Phe	Ser	Leu	Leu	Asn	Ile	Tyr	Arg	Ile	Gly	Asp		
			260					265					270				
Lys	Ile	Val	Glu	Arg	Gln	Gly	Asn	Phe	Ser	Tyr	Asp	Leu	Ile	Lys	Met		
	275						280					285					
Val	Glu	Pro	Ile	Cys	Asn	Leu	Arg	Leu	Met	Lys	Leu	Ala	Arg	Glu	Ser		
	290					295					300						
Arg	Pro	Leu	Val	Pro	Gln	Phe	Pro	His	Phe	Glu	Asn	His	Ile	Lys	Thr		
305					310					315					320		
Ser	Val	Asp	Glu	Gly	Ala	Lys	Ile	Asp	Arg	Gly	Ile	Arg	Phe	Leu	His		
				325					330					335			
Asp	Gln	Ile	Met	Ser	Val	Lys	Thr	Val	Asp	Leu	Thr	Leu	Val	Ile	Tyr		
		340						345					350				
Gly	Ser	Phe	Arg	His	Trp	Gly	His	Pro	Phe	Ile	Asp	Tyr	Tyr	Ala	Gly		
		355				360						365					
Leu	Glu	Lys	Leu	His	Ser	Gln	Val	Thr	Met	Lys	Lys	Asp	Ile	Asp	Val		
	370					375					380						
Ser	Tyr	Ala	Lys	Ala	Leu	Ala	Ser	Asp	Leu	Ala	Arg	Ile	Val	Leu	Phe		
385					390				395					400			
Gln	Gln	Phe	Asn	Asp	His	Lys	Lys	Trp	Phe	Val	Asn	Gly	Asp	Leu	Leu		
			405						410					415			
Pro	His	Asp	His	Pro	Phe	Lys	Ser	His	Val	Lys	Glu	Asn	Thr	Trp	Pro		
			420					425					430				
Thr	Ala	Ala	Gln	Val	Gln	Asp	Phe	Gly	Asp	Lys	Trp	His	Glu	Leu	Pro		
	435						440					445					
Leu	Ile	Lys	Cys	Phe	Glu	Ile	Pro	Asp	Leu	Leu	Asp	Pro	Ser	Ile	Ile		
	450					455					460						
Tyr	Ser	Asp	Lys	Ser	His	Ser	Met	Asn	Arg	Ser	Glu	Val	Leu	Lys	His		
465					470					475					480		

Val	Arg	Met	Asn	Pro	Asn	Thr	Pro	Ile	Pro	Ser	Lys	Lys	Val	Leu	Gln	485	490	495
Thr	Met	Leu	Asp	Thr	Lys	Ala	Thr	Asn	Trp	Lys	Glu	Phe	Leu	Lys	Glu	500	505	510
Ile	Asp	Glu	Lys	Gly	Leu	Asp	Asp	Asp	Asp	Leu	Ile	Ile	Gly	Leu	Lys	515	520	525
Gly	Lys	Glu	Arg	Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met	530	535	540
Ser	Trp	Lys	Leu	Arg	Glu	Tyr	Phe	Val	Ile	Thr	Glu	Tyr	Leu	Ile	Lys	545	550	555
Thr	His	Phe	Val	Pro	Met	Phe	Lys	Gly	Leu	Thr	Met	Ala	Asp	Asp	Leu	565	570	575
Thr	Ala	Val	Ile	Lys	Lys	Met	Leu	Asp	Ser	Ser	Ser	Gly	Gln	Gly	Leu	580	585	590
Lys	Ser	Tyr	Glu	Ala	Ile	Cys	Ile	Ala	Asn	His	Ile	Asp	Tyr	Glu	Lys	595	600	605
Trp	Asn	Asn	His	Gln	Arg	Lys	Leu	Ser	Asn	Gly	Pro	Val	Phe	Arg	Val	610	615	620
Met	Gly	Gln	Phe	Leu	Gly	Tyr	Pro	Ser	Leu	Ile	Glu	Arg	Thr	His	Glu	625	630	635
Phe	Phe	Glu	Lys	Ser	Leu	Ile	Tyr	Tyr	Asn	Gly	Arg	Pro	Asp	Leu	Met	645	650	655
Arg	Val	His	Asn	Asn	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val	Cys	660	665	670
Trp	Gln	Gly	Gln	Glu	Gly	Gly	Leu	Glu	Gly	Leu	Arg	Gln	Lys	Gly	Trp	675	680	685
Ser	Ile	Leu	Asn	Leu	Leu	Val	Ile	Gln	Arg	Glu	Ala	Lys	Ile	Arg	Asn	690	695	700
Thr	Ala	Val	Lys	Val	Leu	Ala	Gln	Gly	Asp	Asn	Gln	Val	Ile	Cys	Thr	705	710	715
Gln	Tyr	Lys	Thr	Lys	Lys	Ser	Arg	Asn	Val	Val	Glu	Leu	Gln	Gly	Ala	725	730	735
Leu	Asn	Gln	Met	Val	Ser	Asn	Asn	Glu	Lys	Ile	Met	Thr	Ala	Ile	Lys	740	745	750
Ile	Gly	Thr	Gly	Lys	Leu	Gly	Leu	Leu	Ile	Asn	Asp	Asp	Glu	Thr	Met	755	760	765
Gln	Ser	Ala	Asp	Tyr	Leu	Asn	Tyr	Gly	Lys	Ile	Pro	Ile	Phe	Arg	Gly	770	775	780

Val	Ile	Arg	Gly	Leu	Glu	Thr	Lys	Arg	Trp	Ser	Arg	Val	Thr	Cys	Val		
785					790					795					800		
Thr	Asn	Asp	Gln	Ile	Pro	Thr	Cys	Ala	Asn	Ile	Met	Ser	Ser	Val	Ser		
				805					810					815			
Thr	Asn	Ala	Leu	Thr	Val	Ala	His	Phe	Ala	Glu	Asn	Pro	Ile	Asn	Ala		
			820					825					830				
Met	Ile	Gln	Tyr	Asn	Tyr	Phe	Gly	Thr	Phe	Ala	Arg	Leu	Leu	Leu	Met		
		835					840					845					
Met	His	Asp	Pro	Ala	Leu	Arg	Gln	Ser	Leu	Tyr	Glu	Val	Gln	Asp	Lys		
	850					855					860						
Ile	Pro	Gly	Leu	His	Ser	Ser	Thr	Phe	Lys	Tyr	Ala	Met	Leu	Tyr	Leu		
865					870					875					880		
Asp	Pro	Ser	Ile	Gly	Gly	Val	Ser	Gly	Met	Ser	Leu	Ser	Arg	Phe	Leu		
				885					890					895			
Ile	Arg	Ala	Phe	Pro	Asp	Pro	Val	Thr	Glu	Ser	Leu	Ser	Phe	Trp	Arg		
			900					905					910				
Phe	Ile	His	Val	His	Ala	Arg	Ser	Glu	His	Leu	Lys	Glu	Met	Ser	Ala		
		915					920					925					
Val	Phe	Gly	Asn	Pro	Glu	Ile	Ala	Lys	Phe	Arg	Ile	Thr	His	Ile	Asp		
	930					935					940						
Lys	Leu	Val	Glu	Asp	Pro	Thr	Ser	Leu	Asn	Ile	Ala	Met	Gly	Met	Ser		
945					950					955					960		
Pro	Ala	Asn	Leu	Leu	Lys	Thr	Glu	Val	Lys	Lys	Cys	Leu	Ile	Glu	Ser		
			965						970					975			
Arg	Gln	Thr	Ile	Arg	Asn	Gln	Val	Ile	Lys	Asp	Ala	Thr	Ile	Tyr	Leu		
			980					985					990				
Tyr	His	Glu	Glu	Asp	Arg	Leu	Arg	Ser	Phe	Leu	Trp	Ser	Ile	Asn	Pro		
	995					1000						1005					
Leu	Phe	Pro	Arg	Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly		
	1010					1015					1020						
Val	Ala	Asp	Gly	Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg		
1025					1030					1035					1040		
Asn	Ser	Phe	Lys	Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val		
			1045						1050					1055			
Arg	Ser	Glu	Val	Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg		
			1060					1065					1070				
Arg	Gly	Ser	Cys	Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr		
	1075						1080					1085					

Leu Arg Tyr Lys Ser Trp Gly Arg Thr Val Ile Gly Thr Thr Val Pro
 1090 1095 1100
 His Pro Leu Glu Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys
 1105 1110 1115 1120
 Ala Pro Cys Asn Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro
 1125 1130 1135
 Asp Gly Ile His Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr
 1140 1145 1150
 Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu
 1155 1160 1165
 Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp
 1170 1175 1180
 Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile
 1185 1190 1195 1200
 Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln
 1205 1210 1215
 His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser
 1220 1225 1230
 Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr
 1235 1240 1245
 Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn
 1250 1255 1260
 Phe Asp Phe Leu Phe Xaa Ala Thr Leu Leu Tyr Ala Xaa Ile Thr Thr
 1265 1270 1275 1280
 Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His
 1285 1290 1295
 Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp
 1300 1305 1310
 Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr
 1315 1320 1325
 Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr
 1330 1335 1340
 Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr
 1345 1350 1355 1360
 Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg
 1365 1370 1375
 Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln
 1380 1385 1390

Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu
 1395 1400 1405
 Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His
 1410 1415 1420
 Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile
 1425 1430 1435 1440
 Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly
 1445 1450 1455
 Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser
 1460 1465 1470
 Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe
 1475 1480 1485
 Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr
 1490 1495 1500
 Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly
 1505 1510 1515 1520
 Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe
 1525 1530 1535
 Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser
 1540 1545 1550
 Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe
 1555 1560 1565
 Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys
 1570 1575 1580
 Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro
 1585 1590 1595 1600
 Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr
 1605 1610 1615
 Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln
 1620 1625 1630
 Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala
 1635 1640 1645
 His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg
 1650 1655 1660
 Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu
 1665 1670 1675 1680
 Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu
 1685 1690 1695

Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala
 1700 1705 1710

Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr
 1715 1720 1725

Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr
 1730 1735 1740

Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val
 1745 1750 1755 1760

Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr
 1765 1770 1775

Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu
 1780 1785 1790

Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala
 1795 1800 1805

Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr
 1810 1815 1820

Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly
 1825 1830 1835 1840

Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn
 1845 1850 1855

Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe
 1860 1865 1870

Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro
 1875 1880 1885

Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln
 1890 1895 1900

Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser
 1905 1910 1915 1920

Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala
 1925 1930 1935

Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro
 1940 1945 1950

Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile
 1955 1960 1965

Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu
 1970 1975 1980

Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp
 1985 1990 1995 2000

Glu	Ala	Val	Ser	Val	Lys	Gly	Gly	Tyr	Lys	Gln	Lys	Trp	Ser	Thr	Arg			
				2005					2010					2015				
Gly	Asp	Gly	Leu	Pro	Lys	Asp	Thr	Arg	Ile	Ser	Asp	Ser	Leu	Ala	Pro			
		2020					2025					2030						
Ile	Gly	Asn	Trp	Ile	Arg	Ser	Leu	Glu	Leu	Val	Arg	Asn	Gln	Val	Arg			
		2035				2040					2045							
Leu	Asn	Pro	Phe	Asn	Glu	Ile	Leu	Phe	Asn	Gln	Leu	Cys	Arg	Thr	Val			
	2050				2055					2060								
Asp	Asn	His	Leu	Lys	Trp	Ser	Asn	Leu	Arg	Lys	Asn	Thr	Gly	Met	Ile			
2065				2070					2075					2080				
Glu	Trp	Ile	Asn	Arg	Arg	Ile	Ser	Lys	Glu	Asp	Arg	Ser	Ile	Leu	Met			
			2085				2090						2095					
Leu	Lys	Ser	Asp	Leu	His	Glu	Glu	Asn	Ser	Trp	Arg	Asp						
		2100					2105											